Using Conceptual Models in Adaptive Management

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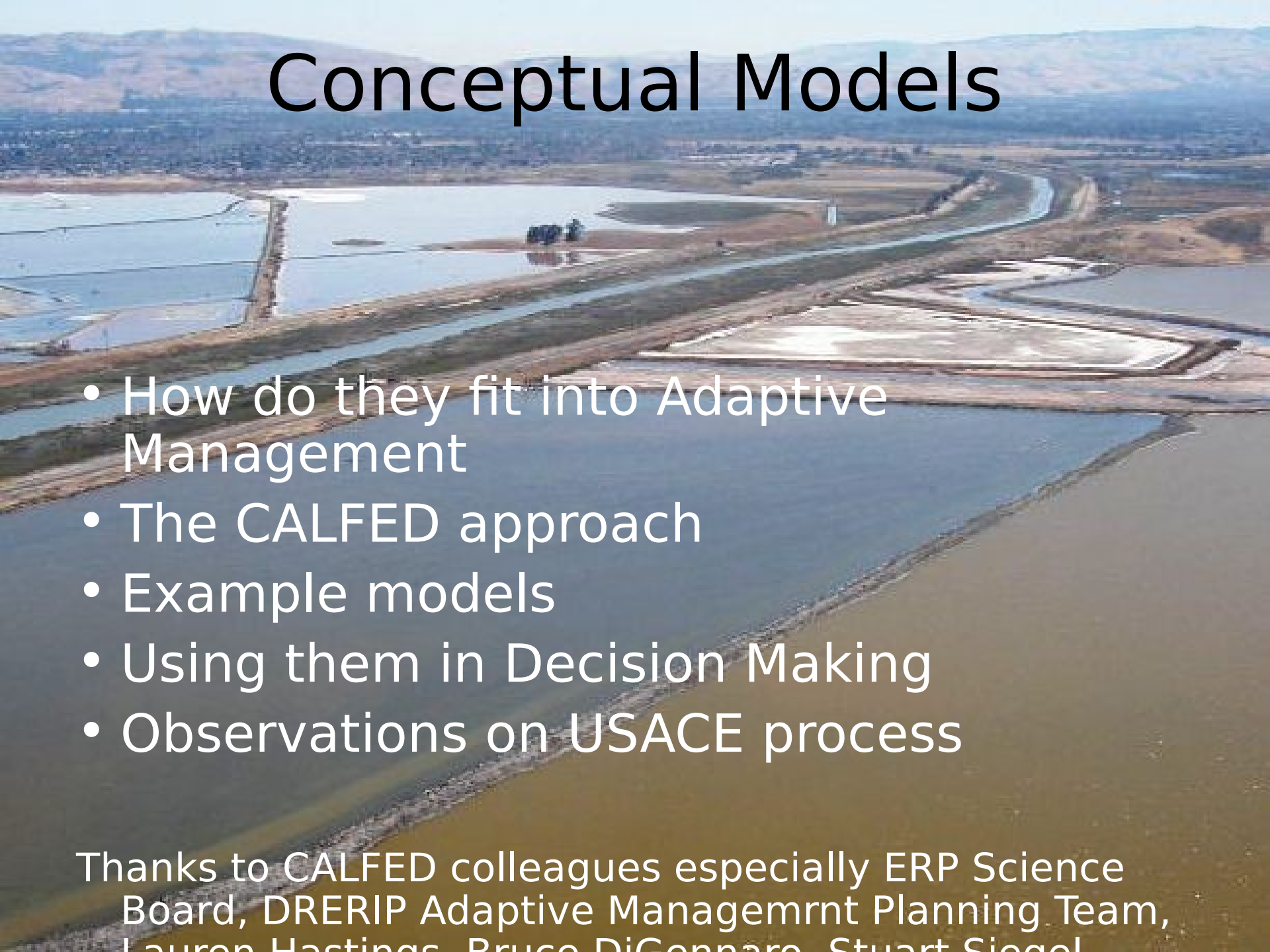
University of New Orleans

Planning Community of Practice May 20

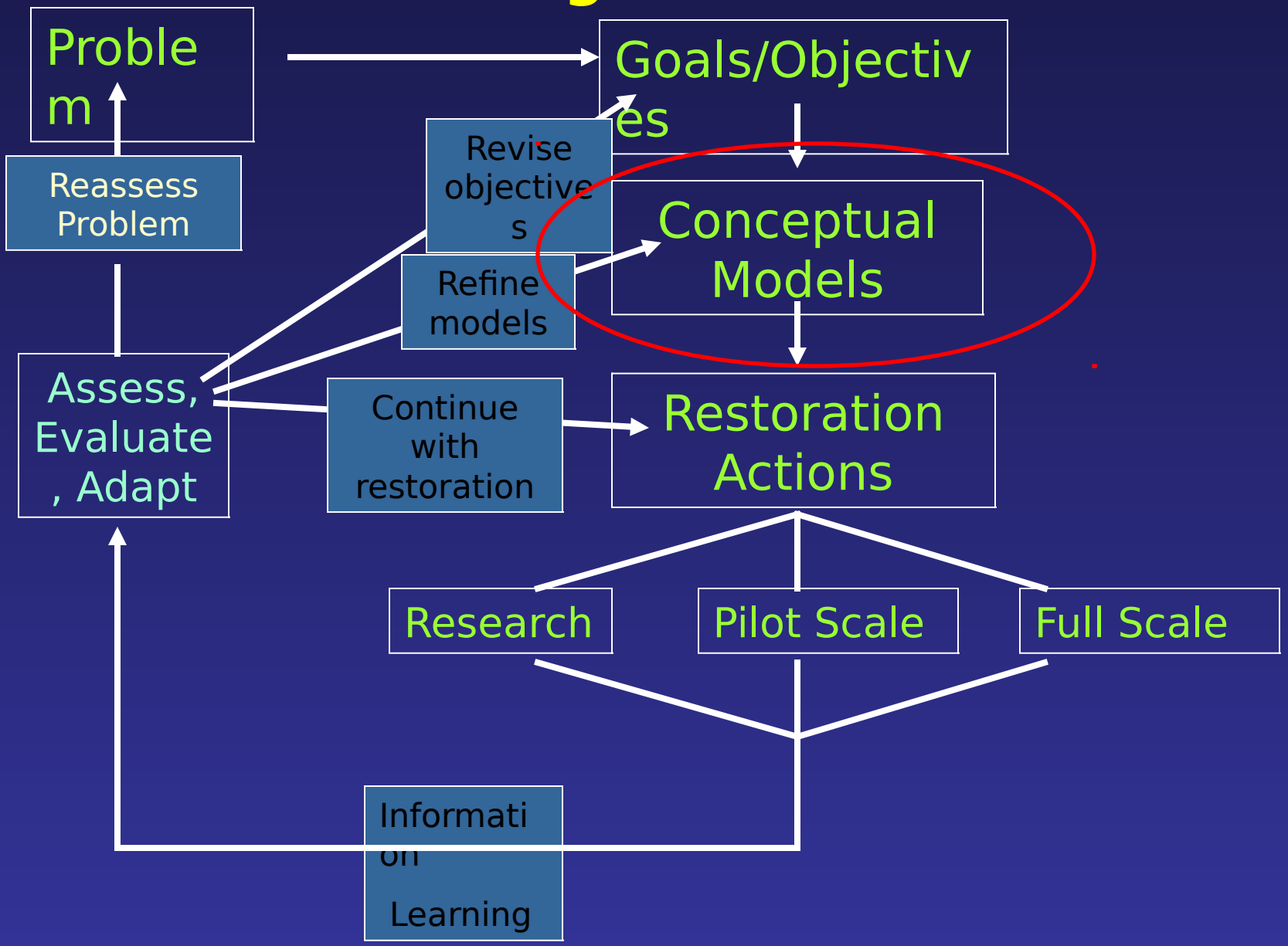
Conceptual Models



- How do they fit into Adaptive Management
- The CALFED approach
- Example models
- Using them in Decision Making
- Observations on USACE process

Thanks to CALFED colleagues especially ERP Science Board, DRERIP Adaptive Managemrnt Planning Team, Lauren Hastings, Bruce DiGennaro, Stuart Siegel

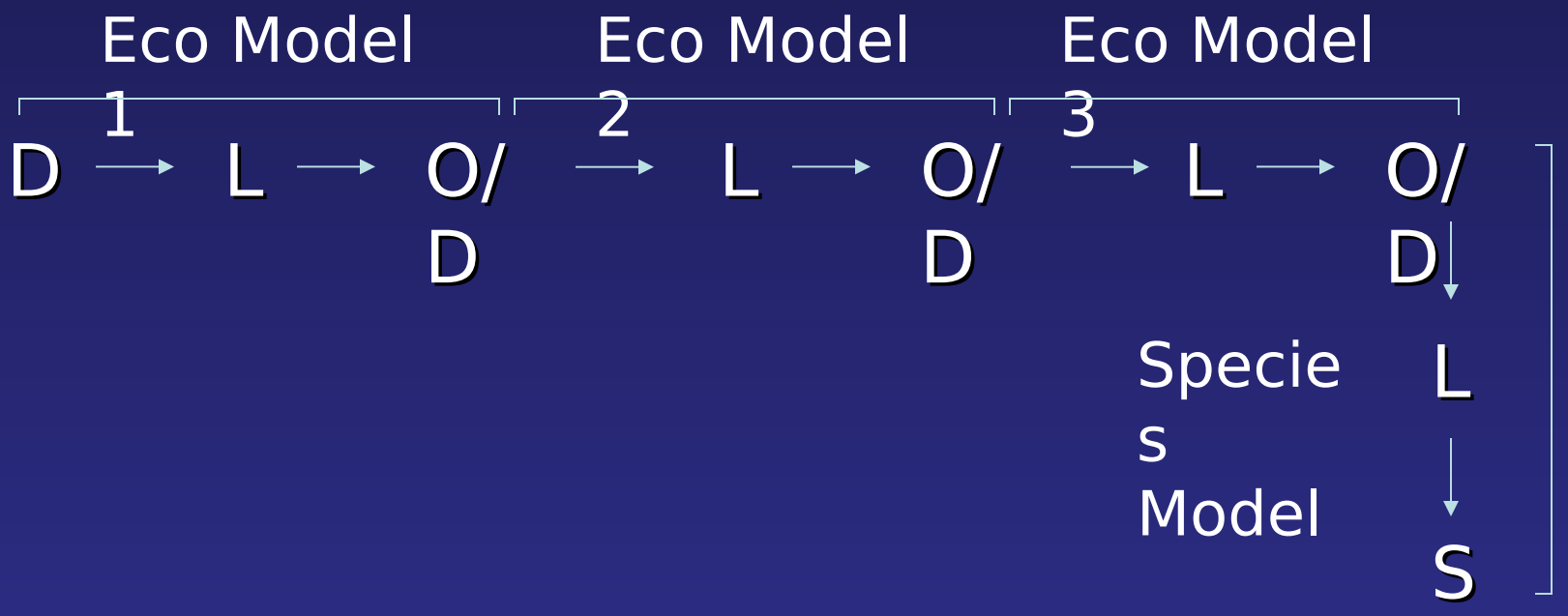
CALFED Strategic Plan Adaptive Management



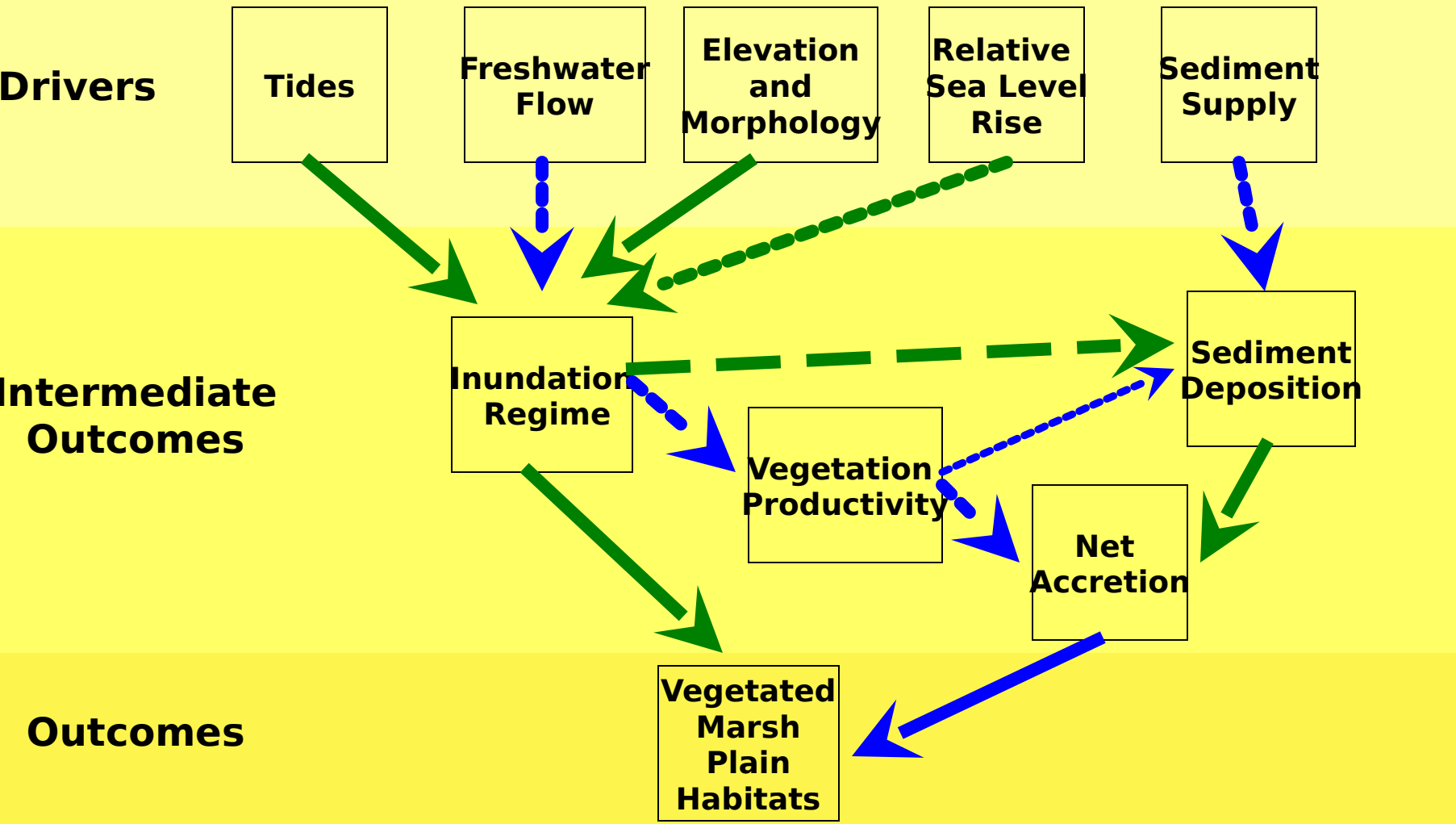
DLO Approach

- **D**rivers
  - Physical
  - Biological
  - Anthropogenic
- **L**inkages (cause & effect)
  - Nature & direction
  - Importance
  - Certainty
- **O**utcomes
  - Physical
  - Biological

DLO Approach



Model 1: Initiating Controls



Importance:

- High – thick line
- Med – medium line
- Low – thin line

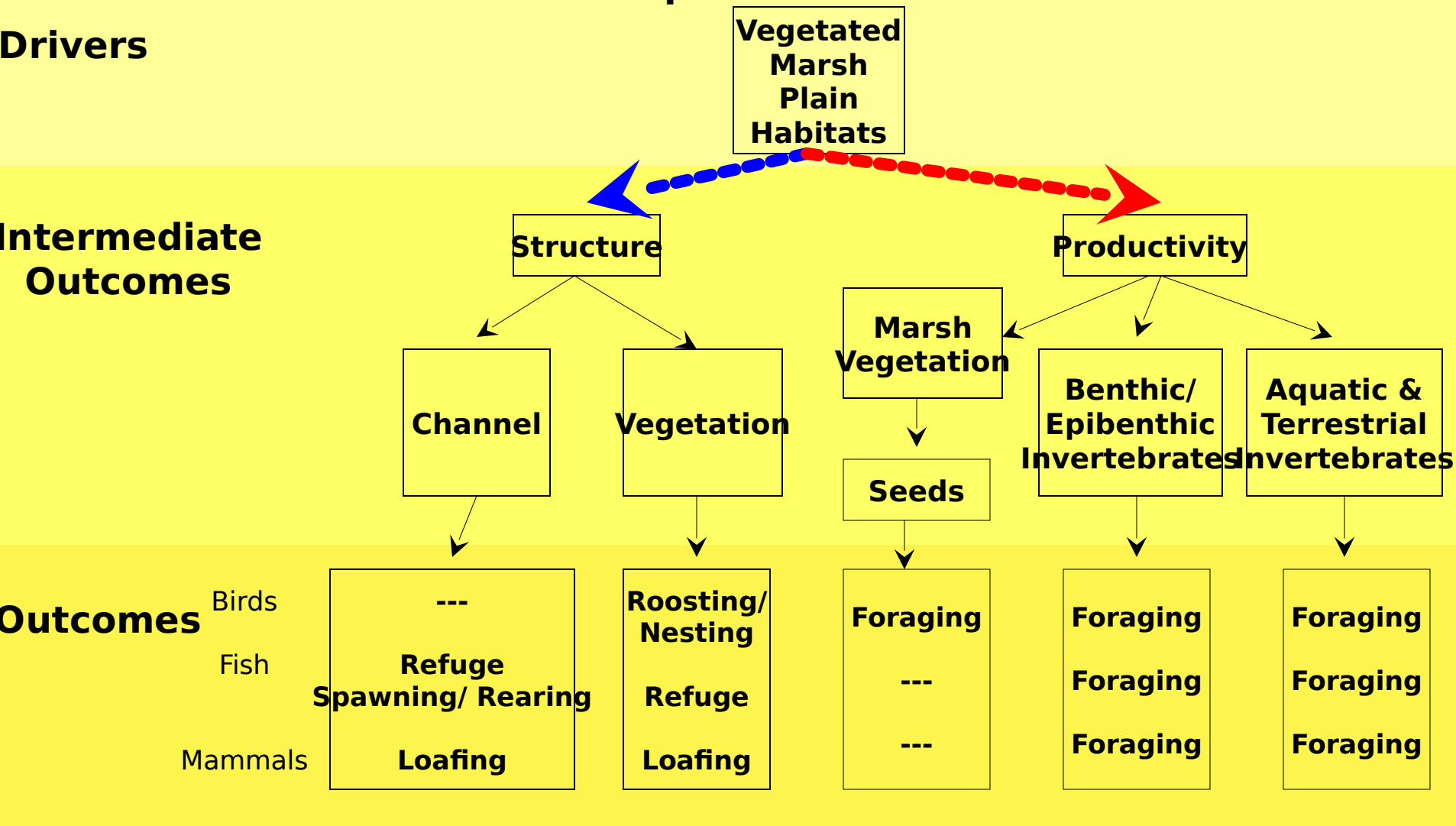
Understanding:

- High – green arrow
- Med – blue arrow
- Low - red arrow

Predictability:

- High – solid line
- Med – dashed line
- Low – dotted line

Model 3: Habitat Outputs



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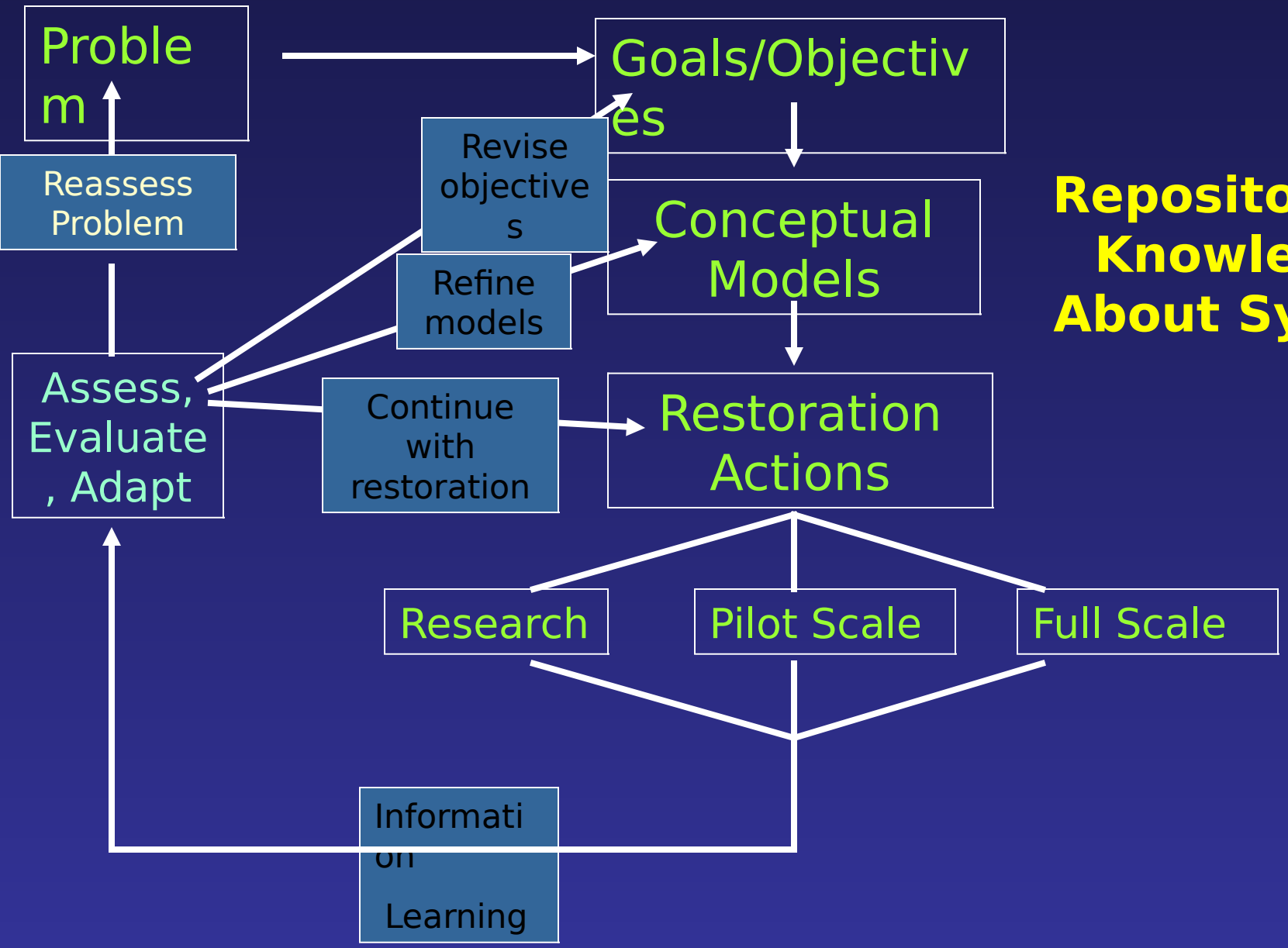
CALFED Strategic Plan Adaptive Management



Repository of Knowledge About System

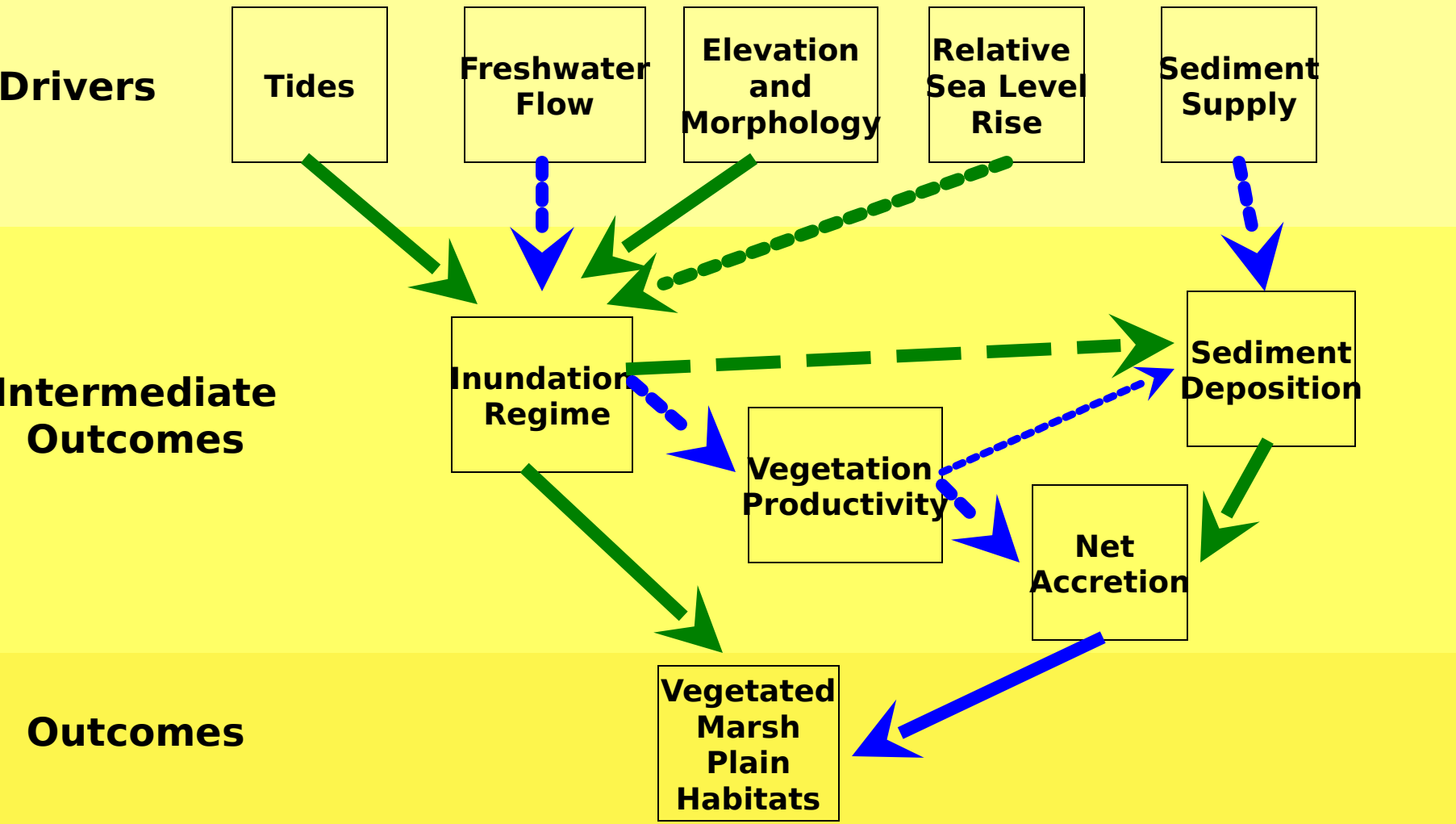
Why is this so Difficult for USACE?

- **D**rivers
  - Physical
  - Biological
  - Anthropogenic
- **L**inkages (cause & effect)
  - Nature & direction
  - Importance
  - Certainty
- **O**utcomes
  - Physical
  - Biological

Why is this so Difficult for USACE?

- Certainty = Predictability
- Certainty constrained by:
  - Imperfect Knowledge, especially in ecosystem context
  - System Variability, at local, regional and global scales
- Understanding ≠ Predictability

Model 1: Initiating Controls



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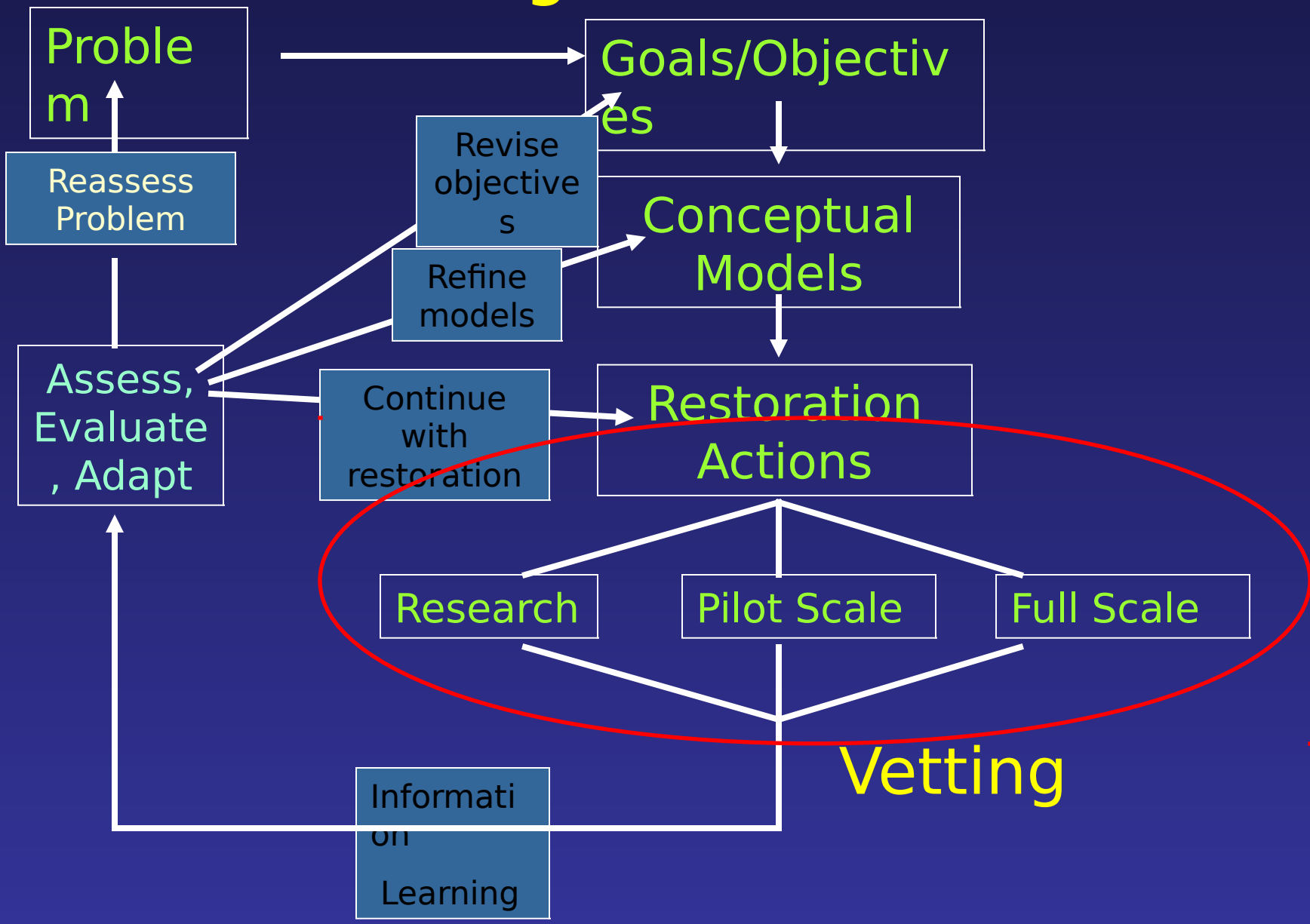
Where Next?

- Demonstration or Pilot projects to increase certainty (e.g., LCA)
- CMs that embrace and articulate uncertainty?
- Probabilistic approach to evaluation?
- Analytical tools that allow scenario analysis?

Strategic Plan Adaptive Management

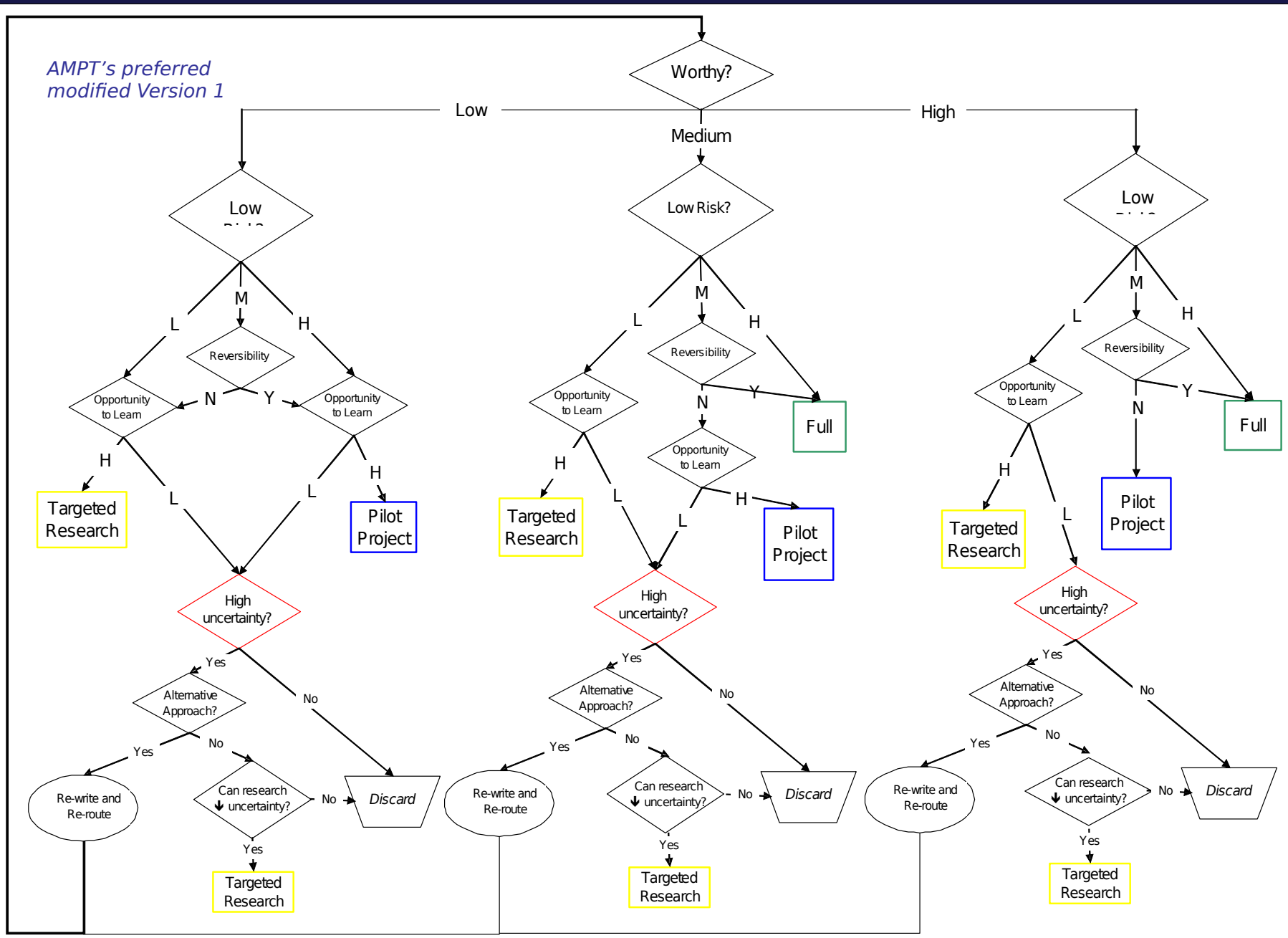


Vetting Criteria
Linking Actions with Outcomes

Consider

- **Positive** ecological outcomes (Worth) - magnitude ***and*** certainty
- **Negative** ecological outcomes (Risk) - magnitude ***and*** certainty
- **Reversibility** of the action
- **Opportunity for learning**

Are we ready to proceed?


AMPT's preferred modified Version 1
Worthy?
Low
Medium
High
Low
Low Risk?
Low
M
L
H
Reversibility
N
Y
Opportunity to Learn
Targeted Research
Pilot Project
Full
High uncertainty?
Yes
No
Alternative Approach?
Re-write and Re-route
Can research ↓ uncertainty?
Discard